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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/579,576	05/25/2000	Ho-Jin Kweon	003364.P048	7384

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EXAMINER

WILLS, MONIQUE M

ART UNIT	PAPER NUMBER
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1746

DATE MAILED: 10/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/579,576

Applicant(s)

KWEON ET AL.

Examiner

Wills M Monique

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) 10-15 and 23-28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 16-22 and 29-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

This Office Action is responsive to the Amendment filed April 14, 2003 and the restriction filed July 1, 2003.

Regarding the Amendment filed April 14, 2003: the rejection of claims 1 & 3 under 35 U.S.C. 102(b) as being anticipated by Miyasaka U.S. Patent 5,869,208 is overcome. The rejection of claims 1-4 & 36 under 35 U.S.C. 103(a) as being unpatentable over Ikawa et al. U.S. Patent 5,922,491 and further in view of Lu et al. U.S. Patent 6,348,182 is overcome. The rejection of claims 5-7 under 35 U.S.C. 103(a) as being unpatentable over Ikawa et al. U.S. Patent 5,922,491 and further in view of Lu et al. U.S. Patent 6,348,182 is overcome. Further claims 1,5,8 & 9 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 6,146,790 is overcome. The 35 U.S.C. §112 second paragraph rejection of claims 10-35 is overcome. The objection of claims 10-35 is also overcome.

However, claims 1,5,20,21,33 & 34 are rejected under 35 U.S.C. 102(b) as being anticipated by Saidi et al. U.S. Patent 5,851,696. Claims 22 & 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saidi et al. U.S. Patent 5,851,696, as applied to claims 1 & 5, and further in view of Matsubara U.S. Pub. 2001/0010807. Claims 1-3,5, 7-6, 16 -19 & 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gosho et al. U.S. Patent 6,589,69490 and further in view of Gan et al. U.S. Patent 6,153,338. Claims 1,5, 8,9 16,17, 29 & 30 are rejected under 35 U.S.C. 103(a) as

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being unpatentable over Omaru et al. U.S. Patent 6,146,790 and further in view of Gan et al. U.S. Patent 6,153,338. Claims 1 & 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyasaka U.S. Patent 5,869,208 and further in view of Gan et al. U.S. Patent 6,153,338. Claims 1-4 & 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikawa et al. U.S. Patent 5,922,491 in view of in view of Gan et al. U.S. Patent 6,153,338. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikawa et al. U.S. Patent 5,922,491 in view of Gan et al. U.S. Patent 6,153,338.

Election/Restrictions

Regarding the restriction, claims 10,13,23 & 26 of Species I, claims 11,14,24 & 27 of Species II and claims 12,15,25 & 28 of Species III are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected Li/Mn. Li/Mn Oxide and Li/Mn transition metal compounds respectively, there being no allowable generic or linking claim. The Applicant did not specify whether the election of Species IV of claims 16-21, 22 & 29-35 was made with traverse.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 18 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "B" is not defined. The examiner assumes it is either Co or Ni, the same elements as "B" in other claims.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1,5,20,21,33 & 34 are rejected under 35 U.S.C. 102(b) as being anticipated by Saidi et al. U.S. Patent 5,851,696.

Saidi teaches a positive electrode material comprising LiCoNiO_2 with a lithium metallic oxide additive including LiTmO_2 where Tm is a transition metal or combinations of transition metals (col. 6, lines 10-20). The positive electrode is made by mixing the active material with a binder, conductive material and organic solvent to form a slurry

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(col. 9, lines 45-68). The slurry is coated on a current collector (col. 10, lines 1-5) and inherently dried.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 22 & 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saidi et al. U.S. Patent 5,851,696, as applied to claims 1 & 5, and further in view of Matsubara U.S. Pub. 2001/0010807.

Saidi teaches a positive electrode comprising LiCoNiO_2 as described herein above.

The reference is silent to the lithium nickel/cobalt oxide having the formula $\text{Li}_x\text{Ni}_{1-y-z}\text{Co}_y\text{M}^n\text{A}_2$.

However, Matsubara teaches that it is conventional to employ lithium nickel/cobalt oxide compounds of the formula $\text{Li}_y\text{Ni}_{1-x}\text{Co}_x\text{M}_x\text{O}_2$ where M is Al, Fe, Mn and B yer is $0.0 < y < 1.3$ and x is $0 < x < 0.5$. This compound improves the charging and discharging cycle characteristics of the positive electrode so that it is retains high battery capacity (abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the $\text{Li}_y\text{Ni}_{1-x}\text{Co}_x\text{M}_x\text{O}_2$ of Matsubara in the electrode of Saidi to improve the charging and discharging cycle characteristics of the positive electrode so that it retains high battery capacity (abstract).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3,5, 7-6, 16 –19 & 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gosho et al. U.S. Patent 6,589,69490 and further in view of Gan et al. U.S. Patent 6,153,338.

Gosho teaches a positive active material comprising LiCoO_2 , LiNiO_2 , $\text{LiCO}_{1-x}\text{Ni}_x\text{O}_2$, wherein $0.1 < X$ and $Y < 0.1$ (col. 6, lines 15-23). The active material is prepared by mixing a binder, conductive agent and N-methyl-2-pyrrolidone to give a slurry (col. 19, lines 45-55). The slurry is applied onto both surfaces of a current collector and dried (col. 19, lines 45-55).

The reference is silent to adding a metal to the lithium electrode.

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Gan teaches adding metal additives such as nickel, aluminum, titanium and stainless steel to increase conductivity of the electrode (col. 3, lines 50-60).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add metal to the lithium electrode of Omaru in order to increase electrical conductivity.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1,5, 8,9 16,17, 29 & 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Omaru et al. U.S. Patent 6,146,790 and further in view of Gan et al. U.S. Patent 6,153,338.

The positive electrode active material was made as follows: 0.5 mol of Lithium carbonate was mixed with 1 mol of cobalt carbonate. The mixture of them was calcinated in air at a temperature of 900° C. for five hours. Further, 95 parts by weight of LiCoO₂ powder was mixed with 5 parts by weight of Lithium carbonate powder. The positive electrode binding agent-was prepared by mixing 91 parts by weight of them with 6 parts by weight of scaly graphite as conductive agent with 3 parts by weight of

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polyvinylidene fluoride as the binder. The positive electrode binding agent slurry (paste) was prepared by dispersing it with N-methylpyrrolidone. Next, a belt type copper film was prepared as a positive electrode current collecting body 11. After uniformly applying the positive electrode binding agent slurry as above mentioned on both surfaces of the positive electrode current collecting body 11 and drying it, the belt type positive electrode 2 was made by compression molding.

The reference is silent to adding a metal to the lithium electrode.

Gan teaches adding metal additives such as nickel, aluminum, titanium and stainless steel to increase conductivity of the electrode (col. 3, lines 50-60).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add metal to the lithium electrode of Omaru in order to increase electrical conductivity.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 & 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyasaka U.S. Patent 5,869,208 and further in view of Gan et al. U.S. Patent 6,153,338.

Miyasaka teaches a positive electrode including a lithiated transition and a carbonaceous metal, such as graphite or acetylene black (col. 12, lines 5-15). The lithiated transition metal may be selected from $\text{Li}_x \text{MnO}_{2-z}\text{A}_z$ (No. 1 on Table 1) and $\text{Li}_x \text{Mn}_{2-y}\text{M}'\text{A}_4$ (No. 2,8,25 & 29 on Table 1). Miyasaka teaches that the positive electrode sheet can be prepared by coating a mixture of lithium manganese-metal complex oxide, electroconductive material, binder and filler on a collectors. See column 8, lines 1-6. The filler include organic solvents such as polypropylene and polyethylene. See column 8, lines 43-48. The elements Co, Cr, Mg and Ce are added to lithium manganese dioxide. *The electrode may also include electrolytic solutions such as propylene carbonate or ethylene carbonate (col. 8, lines 45-55 & col. 9, lines 20-25).*

The reference is silent to adding a metal to the lithium electrode.

Gan teaches adding metal additives such as nickel, aluminum, titanium and stainless steel to increase conductivity of the electrode (col. 3, lines 50-60).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add metal to the lithium electrode of Miyasaka in order to increase electrical conductivity.

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Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4 & 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikawa et al. U.S. Patent 5,922,491 in view of Gan et al. U.S. Patent 6,153,338.

Ikawa teaches a positive electrode including a lithiated transition metal and a including Al and B (col. 25, lines 60-65 and col. 26 lines 5-30). Metal oxides may also be included (col. 9 lines 25-35). The lithiated transition metal may be selected from LiMnO_2 (col. 25, lines 60-65) (subject formula (1)). The additives were employed at 0.2% by weight (col. 25, lines 20-25). The reference also teaches the addition of a fluorine binder during preparation of the electrode.

The reference is silent to a separate metallic additive added to the lithium transition metal mixture.

Gan teaches adding metal additives such as nickel, aluminum, titanium and stainless steel to increase conductivity of the electrode (col. 3, lines 50-60).

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Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add metal to the lithium electrode of Ikawa in order to increase electrical conductivity.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ikawa et al. U.S. Patent 5,922,491 in view of Gan et al. U.S. Patent 6,153,338.

Ikawa teaches a positive electrode including a lithiated transition metal (col. 25, lines 60-65 and col. 26 lines 5-30). Metal oxides may also be included (col. 9 lines 25-35). The lithiated transition metal may be selected from LiMnO_2 (col. 25, lines 60-65). The additives were employed at 0.2% by weight (col. 25, lines 20-25). The positive electrode is made by the process of; mixing said constituents and applying the mixture to a current collector (col. 25, lines 20-35).

The reference is silent to a separate metallic additive added to the lithium transition metal mixture.

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Gan teaches adding metal additives such as nickel, aluminum, titanium and stainless steel to increase conductivity of the electrode (col. 3, lines 50-60).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add metal to the lithium electrode of Ikawa in order to increase electrical conductivity.

Response to Arguments

Applicant's arguments filed 4/14/03 have been fully considered and are persuasive. Applicant contends that Omaru, Miyasaka, Ikawa and Lu do not teach or suggest physically mixing a metal, semi metal additive to the general positive active material composition as a physical mixture. Applicants argue that the additive is part of the combined compound of the positive active material. This assertion is correct and the rejections are overcome.

Conclusions

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Monique Wills whose telephone number is (703) 305-0073. The Examiner can normally be reached on Monday-Friday from 8:30am to 5:00 pm.


Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

If attempts to reach Examiner by telephone are unsuccessful, the Examiner's supervisor, Randy Gulakowski, may be reached at 703-308-4333.

The unofficial fax number is (703) 305-3599. The Official fax number for non-final amendments is 703-872-9310. The Official fax number for after final amendments is 703-872-9311.

Mw

0/00/03


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